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ABSTRACT

Results of a series of studies suggested that excessive early vocal stimulation may be detrimental to infants' cognitive processing, and that optimal development may be associated with a moderate amount of early stimulation. Study 1 involved 59 3-month-old infants and their mothers. Study 2 observed 23 mothers and infants seen 3 months after the child's due date. Study 3 extended the sample to include 31 3-month-old Greek infants and their mothers from intact Greek homes. And study 4 further extended the sample to include 34 3-month-old infants and their mothers who came from diverse socioeconomic and ethnic backgrounds. All four studies found a curvilinear relationship between infants' differential vocal responsiveness (DVR) and the quantity of maternal vocal stimulation (MVS). In each study mothers were rank-ordered according to how much time they had spent talking to their infants during naturalistic sessions and then were separated into high, middle, and low MVS groups. The mean value of infants' DVR was calculated for each group. Differences between the three groups' DVR scores were statistically significant in each study. Low DVR was associated with both too little and too much MVS, while maximum DVR was associated with a moderate amount of MVS. Findings of an analysis of variance on the combined sample for MVS groups in mother- and stranger-present conditions are reported and discussed. (RH)

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THE POSSIBLE DANGER OF EXCESSIVE EARLY MATERNAL VOCAL STIMULATION ON INFANT DEVELOPMENT.*

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THE POSSIBLE DANGER OF EXCESSIVE EARLY MATERNAL VOCAL STIMULATION ON INFANT DEVELOPMENT

The objective of the present studies was to examine the relationship between quantity of maternal vocal stimulation early in life and 3-month old infants' cognitive processing, as this was assessed by the infants' differential vocal responsiveness to mother vs. stranger (DVR), a behavior that has been found to relate to later verbal-cognitive and academic functioning (Roe, 1978; Roe, McClure & Roe, 1982).

STUDY NO. 1. FIRST USA STUDY.

Based on the findings of several studies (Clarke-Stewart, 1973; Cohen & Beckwith, 1979) that maternal vocal stimulation relates positively to linguistic-cognitive development, we had expected a linear relationship between 3-month olds' DVR and quantity of maternal vocal stimulation to the baby during naturalistic conditions.

Method

The subjects in this study were 59 infants and their mothers. The infants were first-born and full-term and came from white, English-speaking, intact American homes of a wide SES background. When the infants were 3 months old a female experimenter visited them in their home. The infant was placed in an infant seat on top of a table and after 3 minutes of base rate behaviors, the mother talked to him/her for 3 minutes from a distance of about 30 inches trying to elicit as many vocalizations as possible. The infant was then left alone for 2

minutes to rest and then the experimenter/stranger interacted with the baby for another 3 minutes, in a fashion similar to that of the mother. These sessions were video-taped and subsequently a naive, independent coder listened to the tapes and assigned a DVR score to each infant by subtracting the time that it spent in non-distress vocalizing during the 3-minute interaction with the stranger from the time that it spent in non-distress vocalizing during the 3-minute interaction with the mother. Subsequently the mother's cumulative amount of talking to the infant was assessed during 30 minutes of naturalistic observations.

Results

Contrary to our expectations, we did not find a linear relationship between DVR and quantity of maternal vocal stimulation during naturalistic conditions. However, when we plotted maternal vocal stimulation vs. DVR, it became apparent that there was a curvilinear relationship. Mothers were rank-ordered according to how much time they had spent talking to their infants during the 30-minute naturalistic sessions and then separated into a high, middle and low vocal stimulating groups and the mean value of infants' DVR was obtained for each group. These data are shown in Figure 1. The differences between the three groups' DVR scores are statistically significant. Low DVR is associated with both too little and too much maternal vocal stimulation while maximum DVR is associated with a moderate amount of maternal vocal stimulation.

STUDY NO. 2. PRETERM INFANTS.

This study was conducted concurrently with study No. 1 and the hypothesis was the same in that we had expected a positive linear relationship between infants' DVR and quantity of maternal vocal stimulation during naturalistic conditions.

Method

The subjects were 23 first-born, low risk preterm infants and their mothers from white, English-speaking intact American homes. The procedure was identical to that of study No. 1 except that these infants were seen when they were 3 months old from due date.

Results

Contrary to our expectations again, we did not find a linear relationship between DVR and maternal vocal stimulation. However, when the mothers were rank-ordered and separated once more into high, middle and low vocal stimulation groups according to how much they talked to their infants during naturalistic conditions and the infants' DVR that was associated with each maternal group was computed, we again obtained a curvilinear relationship between maternal vocal stimulation and infants' DVR. This is shown in Figure 2. The DVR scores among the three groups were significantly different.

STUDY NO. 3. GREEK INFANTS.

The objective of this study was to see if we could replicate the curvilinear relationship between 3-month olds' DVR and quantity of maternal vocal stimulation to the infant during naturalistic conditions in a completely different cultural

setting.

Method

The subkects were 31 full-term, first-born, normal 3-month old Greek infants and their mothers who came from intact Greek homes of a wide SES background. The procedure was similar to that of the previous two studies except that the mother-infant and stranger-infant interactions were tape-recorded (instead of video-taped).

Results

When the mothers were again separated into high, middle and low vocal stimulation groups and the infants' mean DVR score that was associated with each maternal vocalization group was computed, we again obtained a similar curvilinear relationship, as shown in Figure 3. Again, the DVR scores among the three groups were significantly different.

STUDY NO. 4. SECOND USA STUDY WITH FULLTERMS FROM DIVERSE ETHNIC POPULATION PARENTS

The objective of this study was to examine whether the above curvilinear relationship would hold using 34 three-month old normal, American infants and their mothers who came from a wide socio-economic and ethnic background. The procedure was identical to that of study No. 3 and the results yielded again a similar curvilinear relationship as shown in Figure 4, with significantly different DVR scores in the three maternal vocalization groups.

In order to understand the underlying facotrs of this curvilinear relationship, the data from all four studies were combined and the amount of time that the infants spent responding vocally separately to the mother and stranger in each maternal vocal stimulation group was computed. Analysis of variance tests of the infants' vocal responsiveness separately to the mother and to the stranger for the three maternal vocalization groups yielded statistical significance for both response to the mother and response to the stranger. Individual comparisons showed that for the infants' response to the mother there is significant difference between the low and middle maternal vocalization groups while there is no significant difference between the middle and the high nor between the high and the low vocal stimulation groups. On the other hand, for the response to the stranger, there is no significant difference between the low and the middle groups but there is significant difference between both the middle vs. the high and between the high vs. the low stimulating groups. These data are shown in Figure 5. As can be seen, in the low maternal vocalization group infants have low DVR because they responded with low vocal output to both mother and stranger. These were the quiet, apathetic babies. In the middle maternal vocal stimulation group the infants had maximum DVR because they vocalized very much to the mother while they inhibited this vocal output to the stranger, while in the high maternal vocal stimulation group the iinfants had low DVR because they responded with high vocal output to both mother and stranger. We suggest that the infants in this latter group failed to discriminate the mother from the stranger because they

were too excited. There is recent evidence (Gardner & Turkewitz, 1982; Gardner & Karmel, 1983) that high levels of arousal interfere with young infants' cognitive processing. Thus, we think the infants in the high maternal vocal stimulation group, having an over-stimulating mother, may be in a constant state of over-arousal which interferes with their ability to contain themselves and possibly adequately process environmental input.

In conclusion, the results of the present studies suggest that excessive early vocal stimulation may be detrimental to the infants' cognitive processing and also that optimal development may be associated with a moderate amount of early stimulation.

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